

## Deep Space 1: Into the New Millennium

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Deep Space 1 (DS1), launched on October 24, 1998, is the first mission of NASA's New Millennium program. This program is chartered to flight validate high-risk, advanced technologies important for future space and Earth science programs. Advanced technologies chosen for validation on DS1 include solar electric propulsion, high-power solar concentrator arrays, autonomous on-board optical navigation, two low-mass science instrument packages, and several telecommunications and microelectronics devices. Currently in its primary mission, the technology payload is being exercised extensively to assess performance so that subsequent flight projects will not have to incur the cost and risk of being the first users of these new capabilities. Although DS1 is driven by the requirements of the technology validation, it also presents an important opportunity to conduct solar system science. During the primary mission, the spacecraft will fly by asteroid 1992 KD in July of 1999; a later encounter with comet Borrelly is also a possibility. The two science instruments that are being validated, an integrated infrared/visible/ultraviolet package and a plasma physics package, will be used to collect science data during the cruise and encounters. In addition, a suite of fields and particles sensors included to aid in the quantification of the effects of the solar electric propulsion on the spacecraft and near-space environment will be used for science measurements complementary to those of the plasma instrument. The return of science data will demonstrate that the technologies are compatible with the demands of future scientific missions and will ensure that this rare opportunity to encounter such interesting solar system targets will be fully exploited. The presentation will describe the mission, science and technology objectives, and the current state of the spacecraft.